

The Great Paper Waste

CONTENT AREAS

- **Math**
calculations
- **Social science**
resources
- **Language arts**
writing

OBJECTIVES

Students will...

- examine their habits and calculate how much paper waste they generate
- determine what they can do to minimize paper waste
- determine some alternatives to paper products and analyze the advantages and disadvantages
- understand that recycling is good, but not as good as source reduction

MATERIALS

For each student

- The Great Paper Waste Worksheet

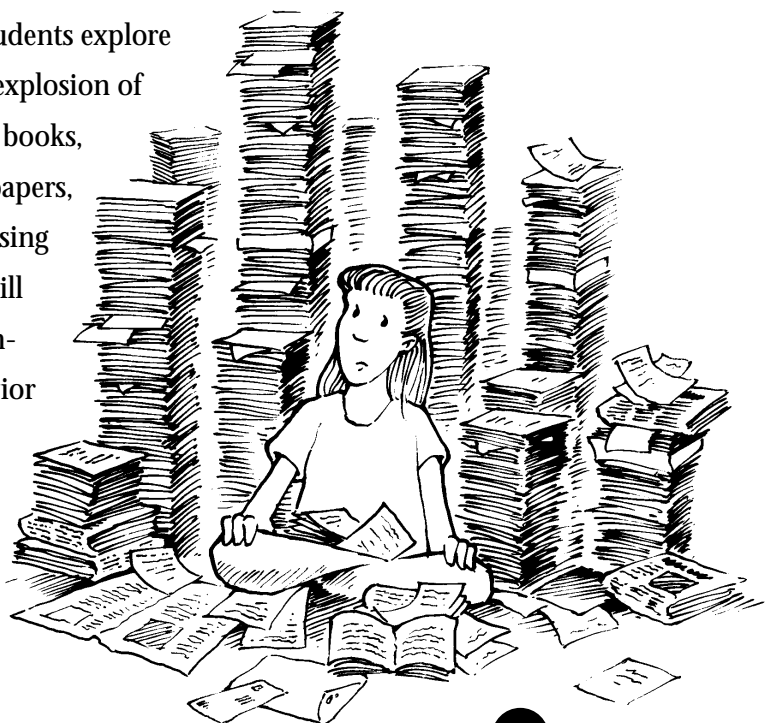
TIME

Two periods
45 minutes each

We depend on paper so much that it is creating a serious waste disposal problem. In fact, paper is the largest category of municipal solid waste. Each year, about 78 million tons of paper and paperboard are generated, or about 560 pounds for every person in the United States.

Won't recycling take care of the problem? Unfortunately, not all paper and paper products can be recycled, and not everything that is recyclable is being recycled. Frankly, just because we recycle paper doesn't mean we shouldn't first think about reducing its use. Recycling can end up using more energy resources than paper made with new paper pulp—it requires labor and resources for collecting, sorting, transporting, de-inking, and milling—a very expensive process. Also, it's not uncommon for 25 percent of the paper collected for recycling to end up as waste once it gets back to the paper mill.

In this activity, students explore the causes of the explosion of paper waste from books, magazines, newspapers, paper and advertising materials. They will consider how technology and behavior can work to reduce paper waste at school, home and the office.



PROCEDURE

1. Ask students to list all the ways they use paper each day. Briefly discuss their lists.
2. Read the introduction of *The Great Paper Waste* worksheet to the students or have them read it.
3. Have students complete the first section of the worksheet. When they are finished, use the following exercise to prove how large of a problem paper waste is. Ask each student for his or her estimate of daily paper use. Total all students' estimates. Divide the total by the number of students in the class to obtain an average number of sheets of paper each student uses in a day. Multiply the average by the number of students enrolled in your school. To convert the figure from sheets of paper to pounds of paper, divide by 145 (or have students calculate the figure themselves). To make the point even more dramatic, go on to calculate paper use over a week, month or year.
4. Make a list on the overhead or board of ways to reduce paper use. At this point, students should be responding that reducing is better than recycling. Make it clear that reusing and recycling are certainly better than throwing away, but we should try to reduce first.
5. Have students work with partners to complete the sections "Other Types of Paper Products" and "At the Office." You may want to discuss students' ideas as a class or pair up teams to share responses.
6. The last question, "What Can You Do?" should be used for closure. The students should individually write down three things they are capable of doing to use less paper.

QUESTIONS:

- a. What did you discover by doing this activity?
- b. What surprised you the most? Why?

EXTENSIONS

1. Call local companies and ask if they have a policy to reduce office waste paper. (Examples of paper-saving efforts include copying on both sides, limiting the copies produced by routing single copies to multiple parties, and using electronic mail.) List the companies that do, what the policy is, how long it has been in effect and the projected savings in pounds of paper and dollars (if known). Share the results with the class and the companies.
2. Research what is done with old phone books in your community. Are they recycled? by whom? how many? for what? Wouldn't it be better not to send phone books to people who don't need them? What policies does your local phone company have on distribution of phone books?
3. Have students develop a way to communicate the need to use less paper – *no paper allowed!*

DID YOU KNOW?

Companies must strive to produce goods using fewer resources in order to be competitive. AT&T estimated that by adopting a double-sided copying policy, they would save 77 million sheets annually and save \$385,000 a year. This would happen if the policy were followed only half the time!

Encyclopedias on CD-ROM are another example of this type of source reduction. They are up to date, more colorful, include sound, and use fewer materials. They ultimately cost much less to produce and to sell as well.

Answer Sheet: The Great Paper Waste

PART 1

My Paper Use

For questions 1 to 4, check students' answers to see if they are reasonable and thoughtful.

For questions 5 and 6, check students' math.

For questions 7 and 8, students should be responding that reducing is better than recycling, and that not everything that *can* be recycled *is* recycled.

PART 2

Other Types of Paper

1. Some of the items and alternatives that could be included in the paper products chart are listed below.

- **Junk Mail:** Send unwanted mail back to the source and ask that your name be taken off the mailing list.
- **Write to the Mail Preference Service**, a no-charge service that removes names from national mailing lists. Send your name and address and any spelling variations you have noticed on mailing labels to:

*Mail Preference Service
Direct Marketing Association
11 West 42nd Street
P.O. Box 3861
New York, NY 10163*

- **Books:** Check books out from the library, trade with friends, use book exchange, sell.
- **Magazines:** Check out from library, trade with friends, subscribe only to ones you read regularly.
- **Phone books:** Get only one new phone book each year; use the old one by a second phone.

- **Newspapers:** Read office, library or school copy, share with neighbor, watch news, access computer bulletin board service news.
- **Encyclopedias:** Use CD-ROM encyclopedias, library encyclopedias, or encyclopedias on computer service bulletin boards.
- **Office paper:** Use computer disks and modems; circulate one memo.
- **Bags and sacks:** Reuse them for small purchases or bring your own bag.
- **Tissues and paper towels:** Use cloth towels and handkerchiefs.

It will take a few months before you notice a decrease. Unfortunately, this won't affect junk mail from local sources. You'll need to write directly to these mailers and ask that your name be removed from their lists.

2. The advantages of these alternatives to paper use include economic savings and less paper use. The disadvantages are inconvenience and need for special equipment.



3. You could do a report by using a CD-ROM encyclopedia or accessing magazine articles through a computer, writing the report on a disk, and turning the disk in to the teacher.
 4. The advantages of a CD-ROM encyclopedia are that the disks are small, do not use paper, are easier to use and update, cost less than a set of encyclopedias, and may have sound and video as well as text and pictures.
 5. and 6. Students may have many different ideas. Accept all ideas.
- Modem: Permits information to be transmitted through a computer; can use electronic mail; needs computer, modem, access line.
 - Computerized phone: Can store messages; need special equipment.
 - Computer bulletin board service: Can send and receive information electronically; must pay for service.
3. Office workers can copy on both sides; use E-mail; reuse “scratch” paper.
 4. Teachers can use both sides of a paper; use classroom sets of papers (when appropriate) rather than one for each student; can use and encourage students to save paper printed on one side and use back for scratch paper.

PART 3

At the Office

1. Copy machines and computers have made it easy to copy and generate papers. Because it is easy to change wordprocessed documents, they are frequently changed and new ones are printed. Photocopy machines are probably the largest contributor to the problem—people can make multiple copies of documents quickly and easily. Photocopiers and printers may also cause some paper loss through technical problems.
2. The following are some technologies, with their advantages and disadvantages.
 - Computer: Stores information that can be read on screen; expensive; need training; must have a computer to read information stored on disk.



The Great Paper Waste Worksheet

Name _____

Imagine a day without paper. No books, no notebook paper, no magazines, no paper of any kind. How would you feel about that? Before some of you start celebrating class without books and no paper for assignments, think about not having paper to write your friends juicy gossip, no motorcycle magazines, no drawing paper to draw cartoons in your most boring class. For better or worse, we all depend on paper... a lot.

We depend on paper so much that it's creating a real waste disposal problem. In fact, paper is the largest category of solid waste. Each year about 78 million tons of paper and paper-board are generated, or about 560 pounds for every American.

Won't recycling take care of the problem? Unfortunately, not all paper and paper products are recyclable, and not everything that is recyclable is being recycled. Frankly, just because we recycle paper doesn't mean we shouldn't first think about reducing its use. Recycling can end up using more energy resources than paper made with new paper pulp—it requires labor and resources for collecting, sorting, transporting, de-inking, and milling the paper—a very expensive process. Also, it's not uncommon for 25 percent of paper that is recycled to end up as waste once it gets back to the paper mill.

As you can see, even after recycling, we're left with a lot of paper, books, and magazines that are sent to waste facilities. As individuals, what can we do to reduce this flood of paper?

Let's start by taking a look at our own paper use.



PART 1

My Paper Use

1. About how many pieces of paper do you use at home and at school each day?

_____ pieces

2. Think about all those pieces of paper. What were they for? Write them down on the list. Then write down how you could have reduced the amount you used.

What I use paper for

1. _____

2. _____

3. _____

4. _____

5. _____

How could I have reduced the amount used?

1. _____

2. _____

3. _____

4. _____

5. _____

3. Had any of the paper been used before?

4. How many pieces of paper could you have saved by using paper that had already been used on one side, by using both sides of your paper, or by being more careful about wasting paper?

_____ sheets of paper saved

5. Multiply that number by the average number of school days in a month (24).

How many sheets would you have saved?

_____ sheets saved per month

6. Now figure out how many pounds of paper waste you will save in a year. There are 145 sheets of paper to each pound.

_____ pounds of paper saved

7. In addition to reducing waste, why else should you try to reduce the amount of paper you use?

8. What about recycling? Did you recycle every recyclable paper? If not, why not?

PART 2

Other Types of Paper Products

1. According to the EPA, paper accounts for 38 percent of waste generated, or 78 million tons yearly. The biggest factor is corrugated boxes, which create 26 million tons of waste yearly. Second is newspapers, accounting for 13 million tons. These are followed by office paper, 7 million tons; commercial printing, 5 million tons; folding and milk cartons, 5 million tons; third class mail, 4 million tons; and tissues and paper towels, 3 million tons. Think of any alternatives that could be used to reduce waste or eliminate the use of these and other paper products.



Paper Products	Alternatives
Corrugated boxes	_____

Newspapers	_____

Office paper	_____

Commercial printing	_____

Milk cartons	_____

Junk mail	_____

Paper Products	Alternatives
Tissues	_____

Paper towels	_____

Magazines	_____

Bags and sacks	_____

Books	_____

Paper plates and cups	_____

Telephone books	_____

2. What are some of the advantages and disadvantages of these alternatives?

3. Describe how you could do a report and turn it in without ever using any paper.

4. In the last few years, as CD-ROMs have become more widespread, new forms of software have been developed that not only take advantage of this interactive form of media, but also replace more traditional forms of paper items. Today, you can find textbooks, dictionaries, cookbooks, and encyclopedias on CD-ROM. Suppose you were required to do a report using a CD-ROM encyclopedia instead of the traditional bound volumes. What would be the advantages and disadvantages of the CD-ROM encyclopedia? List your answers:

Advantages of CD encyclopedias

Disadvantages of CD encyclopedias

5. Think about this activity, which requires every student to use several sheets of paper. How could you do it without using paper?

6. Phone books are a big waste problem. Many are shipped to Asia for use in building products. But, they are still a big problem. Is it possible to eliminate the need for phone books? Don't forget that many companies depend on phone book advertising to get customers.

PART 3

At the Office

1. The advances in office technology over the last 20 years—from photocopy to FAX machines—have resulted in an explosion in office waste paper. Between 1972 and 1987, office paper as a waste category increased by 130 percent. Why has paper waste increased with all this new technology? List your ideas below.

2. What types of technology would reduce the need for office paper? List them on the chart along with advantages and disadvantages of each.

Technology	Advantages	Disadvantages

3. What can be done to reduce the amount of office paper waste?

4. What could teachers do to reduce the amount of paper they use?

PART 4

What Can You Do?

Write down three things you could do to reduce wastepaper.
Then make a poster for your room that helps you remember them.



1.

2.

3.
